the CE, an impedance value of greater than, or equal to, −60 Ohms corresponds to a surface area that is equal to, or greater than, that specified by an equivalent Ra measurement greater than 0.50 um.

While the description above refers to particular embodiments of the present invention, it will be understood that many modifications may be made without departing from the spirit thereof. Additional steps and changes to the order of the algorithms can be made while still performing the key teachings of the present invention. Thus, the accompanying claims are intended to cover such modifications as would fall within the true scope and spirit of the present invention. The presently disclosed embodiments are, therefore, to be considered in all respects as illustrative and not restrictive, the scope of the invention being indicated by the appended claims rather than the foregoing description. All changes that come within the meaning of, and range of, equivalency of the claims are intended to be embraced therein.

What is claimed is:

1. A method of performing real-time sensor diagnostics on a subcutaneous or implanted sensor having at least one working electrode, comprising:

(a) performing a first electrochemical impedance spectroscopy (EIS) procedure to generate a first set of impedance-related data for the at least one working electrode;

(b) after a predetermined time interval, performing a second EIS procedure to generate a second set of impedance-related data for the at least one electrode; and

(c) based on the first and second sets of impedance-related data, deteimining whether the sensor is functioning normally,

wherein each of the first and second sets of impedance-related data includes data for at least one impedance-related parameter that is substantially glucose-independent, wherein said at least one substantially glucose-independent impedance-related parameter is imaginary impedance, and wherein the imaginary impedance is measured at a frequency of at least 1 kHz.

2. The method of claim **1**, wherein each of the first and second sets of impedance-related data includes data for at least one of real impedance, imaginary impedance, impedance magnitude, and phase angle.

3. The method of claim **1**, wherein the determination as to whether the sensor is functioning normally is made based only on said data for the at least one impedance-related parameter that is substantially glucose-independent.

4. The method of claim **1**, wherein the sensor includes between two and five independent working electrodes.

5. The method of claim **1**, wherein each of the first and second EIS procedures is performed for a respective range of frequencies.

6. The method of claim **5**, wherein the range of frequencies for the first EIS procedure is different from the range of frequencies for the second EIS procedure.

7. The method of claim **1**, wherein said at least one substantially glucose-independent impedance-related parameter is real impedance.

8. The method of claim **7**, wherein the real impedance is measured at a frequency of at least about 1 kHz.

9. The method of claim **1**, wherein each of the first and second sets of impedance-related data includes values for impedance-related parameters, and wherein step (c) comprises comparing the value of at least one impedance-related parameter from the first set of impedance-related data to the value of the same parameter from the second set of impedance-related data.

10. The method of claim **9**, wherein the at least one impedance-related parameter is real impedance.

11. The method of claim **9**, wherein the at least one impedance-related parameter is imaginary impedance.

12. The method of claim **9**, wherein the at least one impedance-related parameter is phase angle.

13. The method of claim **1**, wherein, a predetermined time period after the second EIS procedure has been performed and subsequent to step (c), a third EIS procedure is performed to generate a third set of impedance-related data for the at least one electrode, and wherein a determination is made as to whether the sensor is functioning normally based on the second and third sets of impedance-related data.

14. The method of claim **13**, wherein the predetermined time period is different from said predetermined time interval.

15. The method of claim **13**, wherein the second and third EIS procedures are performed for the same range of frequencies.

16. The method of claim **13**, wherein the second EIS procedure is performed for a range of frequencies that is different than the range of frequencies for the third EIS procedure.

17. The method of claim **13**, wherein each of the second and third sets of impedance-related data includes values for impedance-related parameters, and wherein the determination as to whether the sensor is functioning normally is made by comparing the value of at least one impedance-related parameter from the second set of impedance-related data to the value of the same parameter from the third set of impedance-related data.

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